FOG-SIGNALS AT SEA.

BY CAPTAIN C. W. KENNEDY, CAPTAIN SAMUEL BROOKS,
CAPTAIN GEORGE BURTON, AND
CAPTAIN A. BOYER.

THE International Marine Conference to secure greater safety at sea originated with the Superintendent of the New York Maritime Exchange. He observed that the maritime disasters daily communicated to him were of a few general types, the most frequent being the result of collisions in fogs. The main cause of these, he found, was that one vessel could not know the course of another vessel in her vicinity, each being invisible to the other. To lessen chances of collision, it was obvious that representatives of all marine nations should meet and agree upon some simple means by which ships could indicate the course they were steering. The International Marine Conference is called mainly for that purpose, although, while assembled, its delegates may act upon other matters in which all are interested. Still, the adoption of a course-signal is its main object.

It is true that, by common consent and for their own protection, ships and steamers, when enveloped in fog, sound fog-horns or a steam-whistle. But these only announce, "Look out; a vessel is approaching!" In a moment there may be a crash, a few gurgling cries, and "the wealth that far down in the deep ocean shines" may be enriched by another sunken wreck. Had the fog-horn or steam-whistle, by a preconcerted signal, indicated how the approaching craft was moving, the collision would have been averted. But no such signal has ever yet been adopted, although ships have sailed, and been sunk by collisions, from prehistoric times. To our country and our day it has been reserved to apply a remedy.

The Conference of the nations is necessary because, although Neptune's vast domain thrice exceeds in extent all the kingdoms of earth, that mythical potentate has no Congress or Parliament

to make laws for those who walk his waters. They themselves must agree upon regulations for all seamen to observe. The President of the United States has invited the nations to unite in the Conference, and their representatives will meet at Washington in October.

What they will decide upon no one can say. But whatever the fog-signal may be, it should be so very plain and simple that whoever hears it, however unlettered he may be, can instantly and unmistakably comprehend its meaning. Various plans, more or less complicated, have been proposed, but as yet none free from objection. Some favor long and short sounds on the principle of the telegraphic alphabet—excellent in quietude and for educated ears, but indistinct amid the tumult of an ocean storm, even if understood. At the best, sounds seldom penetrate far to the windward in the teeth of a tempest. Some advocate electric signals, and Edison's magic may, perhaps, yet solve the problem. Inventive genius is seldom behind in the race with necessity, and in this case will doubtless come out ahead.

F. W. H.

SINCE the number of steamers trading between the continents of Europe and America has increased, there has also been an increase in the number of collisions. In some cases these have resulted in the total destruction of one of the ships, with a lamentable loss of life. Each time a collision occurs, the question immediately arises, Can nothing be done to avert these terrible disasters? This has caused many a thoughtful man to make it a subject for study; and the result has been that several codes of compass fog-signals have been brought out and laid before the public.

Several years ago, Captain Griffin, of the American Pacific Mail Steamship Company, published an admirable code; but, after being before the shipping interest for a time, it was, like many other useful inventions, laid aside and forgotten. Ten years ago another code of signals for use in fog was brought out by Captain Barker, of this country, which was even better than that arranged by Captain Griffin. I first saw it exhibited in Liverpool, and gave it my particular attention and study. Being then in command of the White Star steamer "Germanic," I was instructed by the company to inspect it and make my report ac-

cordingly. I did so thoroughly, and, being convinced of its utility, I strongly favored its adoption. The same code was laid before the British Admiralty and the Board of Trade. Although it was approved by these bodies, nothing was done towards introducing it into the mercantile marine, and again the subject was allowed to drop. Several codes have since been introduced by others, but they were too complicated, and more liable to cause mishaps than to prevent them.

Every year the number of collisions is increasing; and the travelling public are now asking if something cannot be done that will lessen, if not entirely do away with, these terrible disasters that are becoming too frequent. The steamship companies all acknowledge the necessity of such a code, and, I am convinced, would willingly adopt it, if the Government would take the matter in hand, and make its use compulsory on board all steamers.

At last, after years have been wasted in fruitless agitation, the American Government has taken hold of the matter, and has issued an invitation to all maritime nations to send representatives to a Congress to be held at Washington for the purpose of selecting and adopting a code that will prevent collisions at sea.

In selecting a code for general use, the fact should be borne in mind that the fewer the signals, and the more simple they are, the more effective and useful they will be, and the less liable to cause mistakes. In my opinion, eight signals are all that are necessary; viz., a signal for every fourth point of the compass—N., N.E., E., S.E., S., S.W., W., and N.W. In addition to these eight signals, I would advise a separate signal for ships bound eastward and westward, to be used when a fog is first encountered. In this way two ships sailing in opposite directions could tell by the first sound of the whistle which way each was bound. Then the compass sound-signal could be used to denote in which direction each ship's head was pointed.

By using such a code, if the officers in charge acted promptly, it would be next to impossible for two steamers to come into collision.

I would suggest that the steam-whistles used should be of a uniform size and tone, and not, as they are at present on many small ships, so inferior that they can scarcely be heard a distance of half a mile. When in command of the "Germanic," I had a steam-whistle made in New York of the latest pattern—viz., one

twelve-inch cylinder, with one eight-inch on each side; these gave three distinct tones, which, when blended into one, produced a sound that could be heard, in ordinary weather, eight miles away.

I would advocate that large steamers of high speed should have whistles of large dimensions and great power, and that all should be subjected to a Government test before leaving port on either side; for I believe that a good whistle on board a steamer is as essential as a good chronometer.

That such a code is necessary is proved by the number of collisions that have occurred during the last few years, and these will be more frequent as the number of steamers increases. Had a code been adopted ten years ago, very few, if any, of the collisions that have happened in that time would have been heard of.

Another subject of importance is that the officers of every steamer should undergo a thorough examination as to their acquaintance with the code.

For the benefit of seamen and the public at large, I hope that the Congress that is to meet at Washington will be largely composed of nautical men, who are far better able to judge of what is necessary than landsmen.

CHAS. WM. KENNEDY,
Late Commander White Star steamer "Germanic."

IN my opinion, a code of fog-signals, to be efficient, must be of the simplest kind. I have seen many propositions, some of which would require a large number of blasts to show the course a steamer is steering by compass; but all that I have yet seen have been too complicated to be of use in a sudden emergency. Two steamers approaching each other at the rate of nearly forty miles an hour (combined speed) would not allow their commanders sufficient time to act, if they had to make use of such compass signals, and nine times out of ten, in cases of sudden danger, the signals would probably be misunderstood, and thus lead to disaster. I would, therefore, strongly recommend the adoption of the same signal which has been used for many years by the New York ferry-boats, namely:

One short blast—"My helm is to port."

Two short blasts—"My helm is to starboard."

Thus if I hear a steamer's whistle ahead on my port bow, I immediately put my helm hard-a-port and blow one blast. If I hear the whistle on my starboard bow, I put my helm hard-a-starboard and blow two blasts. Now, if those simple signals are properly understood and acted upon by steamers approaching each other, it is certain they will pass without the slightest danger of collision.

SAMUEL BROOKS,
Commander Guion Line steamer "Arizona."

I THINK steamers ought to be fitted with two separate steam-signals. This could easily be arranged by having two valves on the same steam-pipe. The sounds emanating from these would be as distinct as possible. Thus, the fog-siren would be the ordinary fog-signal to indicate the proximity of a vessel. The whistle could then be used to indicate the approximate course: one whistle, for instance, for "from North to East"; two, for "from East to South"; three, for "from South to West," and four, for "from West to North." When long and short whistles are used, they are apt to be confusing; but any rule which is made by the Maritime Conference should be authorized and enforced by all maritime nations.

Stationary fog-signals, such as those on light-ships and light-houses, might be made more useful by the use of explosives. The ordinary siren, with an explosive signal (it might be a steam one) every two minutes, would allow the mariner sufficient time to distinguish between it and the moving vessel.

GEORGE BURTON,
Commander White Star steamer "Coptic."

YOU ask my opinion concerning fog-signals, and are desirous of learning what I would recommend for the consideration of the Maritime Convention. This is a very complex question; but it is of such prime importance in promoting safety of navigation that I give my opinion without hesitation, convinced that it is the duty of all seamen to contribute their experience to the solution of this serious problem.

Collisions at sea form to-day the gravest—I would add, perhaps the only—danger to navigation. Unfortunately, the rules

laid down by the International Convention are absolutely insufficient to enable even the most vigilant navigators to avoid collisions in thick weather. Are these international rules capable of improvement? I think they are.

According to Article 12, every steamship must be provided *with a steam-whistle, or with some other instrument operated by steam, so placed that the sound shall be unbroken by any obstacle.* Let us observe here that most steamships have the whistle placed in front of the funnel,—a thoroughly ineffectual system, because the waves of sound are broken toward the bow by the masts and and yards, while toward the stern there is a wide section, both right and left of the funnel, in which the sound waves are feeble and probably deflected. The true place for the whistle is, undoubtedly, on the bow of the ship.

But the regulation is wholly silent as to the power of these steam-whistles, although an essential point. Supposing two steamers to be approaching each other with great speed: it is necessary that they should hear each other's signals before the distance separating them becomes too small to permit manœuvring. If each is going at the rate of twenty knots, a maximum speed on the high seas at present, the two boats are approaching at the rate of forty knots an hour, or $\frac{66}{100}$ of a knot per minute. It appears to me indispensable that the respective whistles be heard at least six minutes before the ships meet. Hence it is necessary that the whistles should carry the sound $\frac{66}{100} \times 6$, or $\frac{396}{100}$ of a knot—equal to about four nautical miles.

The same Article says, farther on, that vessels, whether sailing or steam, shall be provided with a fog-horn of sufficient power. It is especially the means for signalling employed by sailing ships. In this wording there is the same vagueness as in the rule as a whole. What are we to understand by the words *sufficient power?* It is evident that a sailing ship, moving more slowly than a steamer, might have an instrument less piercing than the steamer; but still it is necessary that the minimum power should be fixed, and it appears to me that it is important to make the limit two miles for sailing vessels.

Article 12 enumerates the rules adopted for regulating fog-signals: A—*Every steamship, when in motion, should give a prolonged blast of the whistle at intervals not exceeding two minutes.* A steamer has, therefore, the right to sound its signal not oftener

than once in two minutes. Two steamers approaching, accordingly, at the rate of twenty knots each, would thus be able to hear each other's whistles only twice before meeting. It follows that the interval between the blasts of the whistles is altogether too long, and that it has become necessary to decree the blowing of the whistle at intervals not exceeding one minute. It should be the same for sailing ships.

We next have Article 13, according to which every vessel, whether steam or sail, shall go at reduced speed in thick weather, be it fog or snow. The evident intention is, if not altogether to avoid collisions, to render them less disastrous. But it requires more precision of statement. What is the meaning of *reduced speed?* The phrase is so vague that I have frequently heard of captains who have been satisfied by merely checking the speed a few turns of the engine. It is, therefore, essential to have a given maximum of speed distinctly stated.

But I hardly think that the advantages resulting from such reduction of speed can counterbalance the commercial disadvantages to navigation Many captains consider that by moving ahead rapidly they may sooner pass out of the fog-belt and reduce the time of exposure to collision, while, if in the neighborhood of land, in the absence of astronomical observations and the horizon being hidden, the ship must be kept at a normal speed, in order to form an approximate estimate as to the degree of approach to the land and thus avoid shipwreck. Finally, speed forming the chief element in the success of steamship lines, few captains would yield such an advantage in the general competition. They are willing to accept a certain reduction of speed; but if said reduction be too great, it may be feared that they would not observe the rule, which would be the worst possible solution of the problem. Therefore, I do not think it expedient to avoid collisions by forbidding a speed of over seven or eight knots. Nevertheless, in view of their responsibility, a precise regulation fixing a maximum speed in such cases would be a thousand times more acceptable to sea-captains than the indefiniteness of the rule now in practice.

In fine, I am inclined to think that at a distance of, say, sixty miles from land, steamers may be allowed to go at full speed under the following conditions:

First.—That they have whistles, or some other instrument of

sound, capable of being heard at a minimum distance of four nautical miles.

Second.—That this whistle be placed ahead of the foremast.

Third.—That they cause the whistle to be blown at intervals not exceeding one minute.

Fourth.—That they be required to bring the engine to a stop as soon as they hear the signal of another vessel.

The last rule will not be satisfactory to navigators, as they desire to preserve steerage-way; nevertheless, it seems important that the exact position of a ship in the vicinity should be ascertained. After a few minutes, when the speed has been reduced, the captain can order the engine set slowly in motion again before the escape of steam extinguishes the sound of the signals of the other vessel. While collisions may not always be avoided by this means, their results may be rendered much less terrible.

The existing rule is entirely silent as to the management of steamers when their respective signals are heard. It is, unfortunately, true that numbers of collisions might be avoided if the vessels but kept on their course. And often the courts have condemned captains who have altered their course with the best intention, and brought about collisions avoidable if the regular course had been followed. On the other hand, there is no record of how many accidents have been escaped because one of the meeting ships has held on her course. The uncertainty on this point is great. Nevertheless, it is well to observe that Article 15, like Article 16, clearly specifies that, when two steamers meet, that one which *sees* the other in a given position shall manœuvre to avoid a collision, while the other keeps on her course. The rule emphatically implies that, before altering their course, the ships should see each other, and that to do so without so seeing each other may cause a collision.

It may be said in favor of holding the course that if, in case of collision, one of the two ships should not move, even in clear weather, the captain who keeps on his course gains fifty to one hundred chances in his favor. In addition, it should be well understood that two ships on the sea are like two moving points in the midst of boundless space, and that nine hundred and ninety-nine times in a thousand these two points would not meet but for the awkwardness of man. It is, however, essential that, if

the Conference decides that the two steamers shall hold their course, the rule to that effect be strict and clearly stated.

It is to be hoped that science may discover some means for more precisely locating a sound at sea, as now it often appears to come from a direction opposite to that from which it actually proceeds. Were that to become the case, there would be nothing to prevent laying down such rules as apply to ships when able to see each other, and directions could be indicated such as are used in the Morse alphabet, as, for example, a long ———— signal to indicate a ship going in an easterly direction, N. E. to S. E., followed by a short whistle thus ——— ——.

It remains to be said that steamships should be required to follow a specified route, changeable with the seasons. Such routes could be deduced, for example, from the admirable American Hydrographic pilot-charts. Assuredly, with one route for going and one for returning, sufficiently separated along the most frequented ocean highways, the risks of collision between steamers would be reduced. Although the danger of collision between steamers and sailing ships might continue as formidable as before, yet on this point we may say that the number of sailing vessels is constantly decreasing, while the number of steamships is as steadily on the increase.

Finally, our methods of construction may be so improved as to add to the safety of navigation by increasing the number of compartments to such a degree that a ship may continue to float even after many of her compartments are filled.

Such is a résumé of my views on this question. In this rapid survey I have said nothing which may not be known to all navigators, but I shall not the less esteem it an honor if my experience can prove of use in reopening the revision of regulations that are out of date, badly arranged, and often even dangerous.

I cannot end without calling attention anew to the very remarkable and complete work which M. Bavaré, head of the branch of Nautical Instruction at Paris, published on this subject in several numbers of the *Revue Maritime et Coloniale* during the year 1888.

A. Boyer,
Captain French Line steamer "La Champagne."